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Abstract

In order to improve profitability, the e-grocery business needs to excel in both operational efficiency and in creating lasting customer relationships. In the brick-and-mortar business, the Efficient Consumer Response (ECR) development movement has addressed similar issues for several years now. Currently, ECR is moving into the field of e-grocery shopping as well. An interesting question is, however, whether ECR actually can provide the support necessary for getting the e-grocery business on its feet, and whether it is flexible enough for meeting the new needs of the electronic business.

This paper looks at two of the focus areas of ECR - supply management and demand management - and examines how well the existing ECR ideas and improvement concepts suit the e-grocery development. In addition, potential changes and new elements to the ECR required by the e-grocery business are discussed.

Keywords: Efficient Consumer Response (ECR), e-grocery business, electronic grocery shopping, supply management, demand management, category management, e-grocery services.

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1. Introduction

Making money in the grocery business is hard. Making money in the e-grocery business is even harder. To become profitable, the e-grocers have to excel in two areas. Operational efficiency especially in order picking and home delivery (Kämäräinen et al., in press) is needed for cutting costs. The ability to attract and retain customers is needed for attaining the high customer densities (Saranen and Småros, 2001) and large repeat purchases critical to increased revenues (Reichheld and Schefter, 2000).

In the brick-and-mortar business, similar challenges related to operational efficiency and customer relationships are addressed by the Efficient Consumer Response (ECR) development movement. ECR has previously mainly focused on the brick-and-mortar, physical grocery business, but is now moving into the field of e-grocery shopping as well (see, for example, Pramataris and Doukidis, 2000; Roland Berger & Partners, 2000). However, an interesting question is how well the existing ECR development concepts support the e-grocery environment, and whether ECR is flexible enough to meet the new needs of the electronic business model.

In this paper, two of ECR's focus areas - supply management and demand management - are discussed from an e-grocery point of view. The applicability of the existing improvement concepts is reviewed, and the potential changes and new elements required by the e-grocery business discussed.

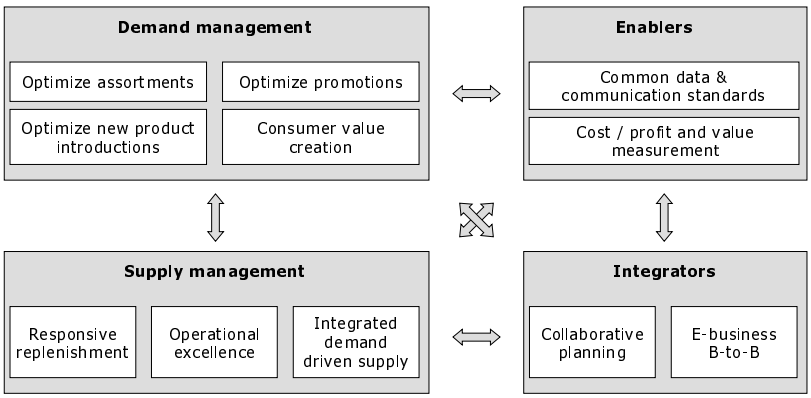

Figure 1. The four focus areas of ECR (ECR Europe, 2001).

2. Supply management

In supply management, ECR emphasizes two things: systemwide efficiency, i.e. overcoming inter-organizational barriers that reduce total supply chain efficiency, and demand as the main driver of the supply chain, i.e. consumer demand "pulling" the goods through the supply chain (Mitchell, 1997). The e-grocery business offers several opportunities to get closer to these ECR ideals.

Currently, the grocery supply chain is often seen to end at the grocery store. This means that little attention is paid to the time consumers spend getting to and from the store, picking products in the store, and standing in line at the checkouts. In the e-grocery business, however, the products are picked and delivered by the e-grocer, which means that efficiency also in the last link of the supply chain becomes important. Performing the picking and transportation tasks more efficiently than the consumer, and in this way increasing the total supply chain efficiency, is not difficult. However, since consumers in general are not used to putting a price on their leisure time, or even car costs, it is difficult for the e-grocers to justify the cost of their service (Yrjölä, 2000). Further improving the cost-effectiveness of these operations, therefore, has a high priority for the e-grocers.

E-grocery shopping also offers an opportunity to cut supply chain costs. Calculations indicate that by by-passing the expensive supermarkets and using distribution centers that are optimized for efficient picking and transportation rather than appealing shelf presentation of products, operational costs can be cut significantly - potentially even so much that the cost disadvantage (including home delivery and picking costs) of this new way of operating disappears (Macht 1996; Jaakola, 2000). Moreover, inventory levels are likely to drop in the e-grocery business model. This is because distribution centers can operate according to a flow-through material handling philosophy while supermarkets need to keep excess inventory to display the products (Jaakola, 2000). In the e-grocery business model, the consumer demand signal, therefore, flows less distorted through the supply chain.

These e-grocery opportunities are clearly in line with the ECR supply management objectives. The three groups of improvement concepts - responsive replenishment, operational excellence and integrated demand driven supply - also clearly fit the e-grocery environment. In addition, most of the practical improvement concepts organized under these headings sustain their importance - synchronized production and integrated suppliers are just as relevant in the electronic as in the physical business model, and the same goes for concepts such as continuous replenishment and efficient unit loads (Table 1).

However, the existing improvement concepts do not cover the whole e-grocery development need. Some important pieces are missing, especially in the areas of distribution center design and efficient home delivery. The knowledge about picking systems and product flow techniques that can found in other businesses has to be studied and tested to understand how it is best applied to the grocery business. Small shipments and deliveries to residential areas also need to be further developed. In addition, methods for increasing home delivery reliability as well as the reliability of the electronic storefront are needed. Here, the ECR movement could be of much help by encouraging research and practical testing in these areas, as well as by packaging the results into best practice improvement concepts in order to distribute the knowledge and experiences.

Table 1. Current ECR improvement concepts and their relevance in the e-grocery business.

	Improvement concepts	Importance in the e-grocery business	Missing pieces
Responsive replenishment	Automated store ordering	-	Distribution center design (use of product flow techniques, automation etc.) Planning and control tools for efficient home delivery
	Continuous replenishment	Just as relevant	
	Product flow techniques	Increased importance due to role in distribution center design	
	Transport optimization	Increased importance due to increased amount of small shipments Increased opportunities for consolidation	
	Efficient unit loads	Just as relevant	
Operational excellence	Reliable store operations	Just as relevant	Reliable picking operations Reliable home delivery Reliable electronic store front
	Reliable distribution	Just as relevant	
	Reliable production	Just as relevant	
Integrated demand driven supply	Synchronized production	Just as relevant	
	Integrated suppliers	Just as relevant	

Adding some new tools to the ECR toolkit is not enough, though. The e-grocery business also brings with it some totally new elements to grocery supply management, of which running two business models - a physical and an electronic - in parallel is perhaps the most important.

E-grocery shopping is for many grocery retailers a complement to their main business, the brick-and-mortar grocery business. This means that they run both business models in parallel. The challenge here is to avoid duplicating efforts and instead share resources between the operations. Important questions are, among others, how the existing grocery store infrastructure can be used in e-grocery operations, and whether some parts of the new emerging e-grocery infrastructure can replace less efficient parts of the traditional grocery supply chain. Rebuilding supermarkets to contain picking areas for e-grocery orders is, for example, a concept that could present a low-investment solution for grocery chains that want to get into the e-grocery game (Yrjölä, 2000). However, the current ECR strategies and concepts offer little support for this type of development.

3. Demand management

The core of ECR demand management is the category management process (Figure 2). Category management is based on the idea of managing product categories as strategic business units. The category management process defines the categories, gives them business roles, assesses them and sets performance measures. The process also defines strategies for realizing the category's performance objectives, as well as tactics for carrying out the strategies. Finally, the tactics, i.e. the decisions concerning assortments, pricing, shelf presentation and promotions, are implemented and the results reviewed, which starts another development round. (The Partnering Group, 1997)

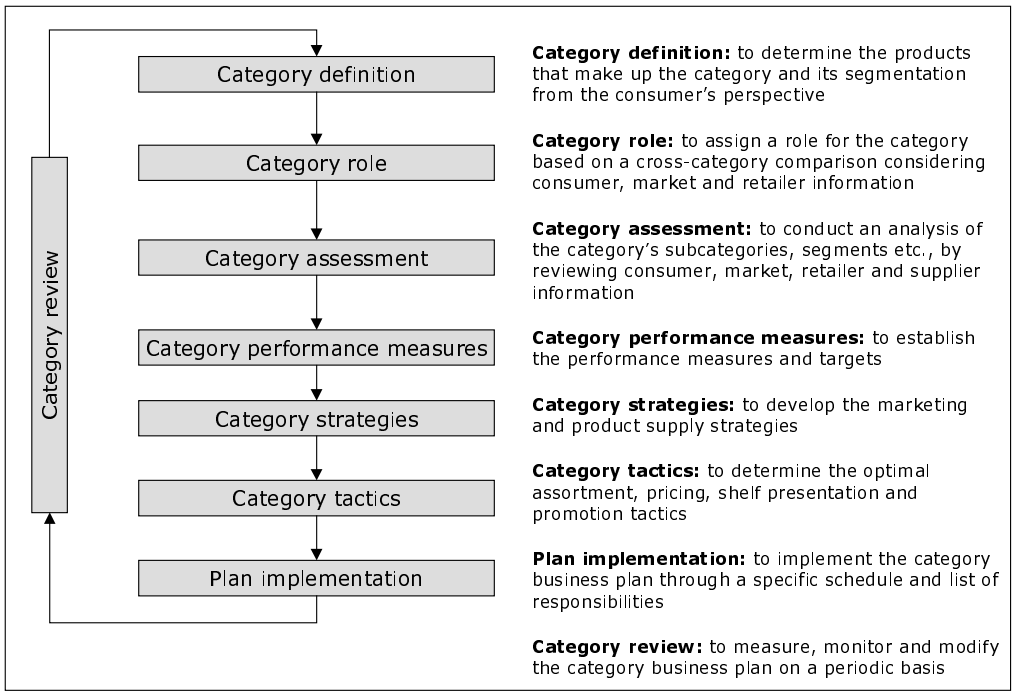

Figure 2. Main phases of the category management process (The Partnering Group, 1997).

In addition to the very product centric category management process, the ECR movement has recently expanded its view of demand management to include a new element, consumer value creation (ECR Europe, 2001). Consumer value creation deals with concepts such as loyalty management and offering integrated solutions to the consumer. The aim is to move from transactions to relationships and from products to complete solutions. (Noteboom, 2000) To date, however, only few practical examples of this kind of development can be found in the grocery business.

3.1. Differences between the electronic and the brick-and-mortar grocery business

Although most of the existing demand management ideas are applicable to e-grocery shopping as well, a few differences between the business models need to be taken into account. Almost all of these differences are related either to the change in shopping environment - from physical store and physical products to digital store and product information - or to the change in communication and interaction between retailer and consumer - from in-store interaction to interaction throughout the consumer's purchasing process.

Moving from a physical to a digital shopping environment brings with it several important changes. Firstly, physical space becomes irrelevant. In the e-grocery store, it is the consumer's limited attention and willingness to spend time selecting and comparing products, rather than availability of store space, that dictates the number of products that can be put on display.

Secondly, the products' physical restrictions become irrelevant. In the physical store, product characteristics, such as size, weight and preservation temperature, have to be

considered when making product placement decisions (Mitchell, 1997). The e-grocery store, however, is not bound by these restrictions and products can be placed solely according to the their use or purpose.

Thirdly, the e-store can be customized. The physical supermarket always looks the same and contains the same products regardless of who enters it, but the digital store can look different to different customers (Pramataris and Doukidis, 2000).

Although moving from a physical shopping environment to a digital one has many advantages, it also brings with it some new problems. For example, it seems that people often find it easier to orientate in a physical store than to browse electronic product lists (Morganosky and Cude, 2000). In addition, since the customers cannot touch and examine the goods, finding the right product can be difficult.

The increase in opportunities to interact with the consumer is also an important difference between the e-grocery store and the supermarket. In the brick-and-mortar grocery business, the physical store is the main point of interaction between consumer and grocer. The interaction, therefore, mainly consists of in-store activities, such as product demonstrations or cooking tips given by the employees. In the e-grocery business, however, the e-grocer and the consumer are linked by an electronic communication channel that enables interaction throughout the consumer's purchasing process. This means that the e-grocer can break out of its old role of provider of products (Lempert, 2000), and offer support for activities such as planning and making sure all regularly needed products are available. A step in this direction is, for example, Netgrocer's replenishment service (Netgrocer, 2001).

By understanding the differences between the electronic and the physical business models, it is possible to significantly improve the value of e-grocery shopping. Responding to the challenges and exploiting the opportunities of the new electronic business model, however, requires systematic development. The existing category management process needs to be adapted to the e-grocery shopping environment in order to improve product organization and selection. In addition, service management is needed in order to take advantage of the new opportunities to interact with the customer.

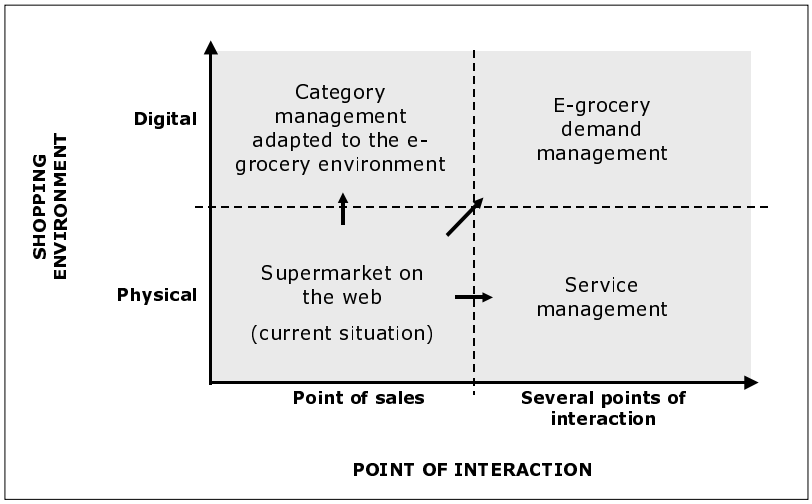

Figure 3. There is a need for adapting category management to the electronic environment as well as for developing service management.

3.2. Category management adapted to the e-grocery environment

The existing category management process provides a good starting point for the e-grocery development efforts. However, adjustments will be needed on all levels of the process in order to adapt it to the new electronic shopping environment.

In the short term, e-grocery shopping mainly affects the lower level category management activities. In the digital e-store, changing assortments and layouts is easier than in a physical store, which means that modifications based on the results of the category review can be made more rapidly (Pramataris and Doukidis, 2000). Some performance measures will also change - the old space related performance measures, such as profit in relation to shelf space, become obsolete in the new electronic environment, and need to be replaced with new ones.

However, it is the category tactics that face the strongest and most acute pressure to change:

- Assortments. Since the e-store is digital, i.e. the physical logistics are separated from the display and marketing of the products, it is possible to create a large range of very targeted stores that match highly differentiated customer segments, without increasing logistical complexity. Furthermore, the assortment can even be customized to suit each individual customer's preferences. In fact, most e-grocers already offer some level of customization by letting the customers create lists of their favorite products or by automatically creating lists of products purchased by the customer (see, for example, Peapod 2001; Tesco, 2001; Webvan, 2001).

- Shelf presentation. In the e-store, the customer cannot touch or examine the products, which means that she has to rely on the available product information when choosing what to buy. This makes high quality product information one of the key success factors in e-grocery shopping. Quality product information is also crucial for exploiting one of the main strengths of e-grocery shopping - easy product comparison.

The product presentation tactics are also affected by the different logic in displaying products - lists rather than shelves. Extensive market research is needed for unveiling what the main parameters affecting product presentation efficiency are. Something that needs to be examined is, for example, how many products per category or subcategory should be displayed at the same time. In addition, as there is some evidence that the order in which the products are displayed may make a difference (Lohse, 1997), this needs to be investigated. Furthermore, it is important to examine how products can be presented in an enticing way.

- Promotions. The electronic environment makes it possible to target promotions according to, for example, customer purchase patterns or demographic information (Pramataris et al., 2000). Furthermore, the electronic business model makes it possible to compare different promotion tactics by making one offering to some consumers and a different one to others. This, however, requires much data analyzing capacity to be of any use. In addition to the opportunities, there are also some challenges. Displaying and drawing attention to promotions is more difficult in the e-grocery environment.

In the long run, changes also in the higher levels of the category management process are to be expected. Category roles will need to be reconsidered as customer shopping behavior changes. The most radical changes, however, take place in the category definition step of the process. Not being bound by any physical restrictions means that it is no longer necessary consider aspects such as storage temperatures when creating categories. In addition, since having the same product in two categories does no longer increase inventory management complexity, it becomes easier to create solution based (Mitchell, 1997), rather than product group based, categories. This means that the consumer can be offered new categories, such as healthy snacks or breakfast ingredients, in addition to traditional categories such as frozen goods or bread.

3.3. Service management

In the e-grocery business, the grocer and the consumer are linked by an electronic communication channel that enables interaction throughout the consumer's whole purchasing process, i.e. also during the phases that precede the product selection. This makes it possible for the e-grocers to offer added value through new services. These new service opportunities can be illustrated using the demand chain approach (for a more detailed description, see Småros et al., 2000).

The grocery customer's purchasing process begins with an impulse, an awareness of a need. This awareness can be the result of some new information or of a sudden realization. The impulse is then followed by a chain of activities aiming at fulfilling the discovered need. For the grocery customer, this chain of activities consists of all or some of the basic steps: planning (e.g. the consumer plans what she will cook during the weekend), inventory management (e.g. the consumer checks the fridge to see what needs to be replenished), and purchasing (e.g. the consumer selects which products to buy).

Traditionally, supermarkets have focused on the purchasing part of the demand chain by trying to have the right products available and nicely displayed, keeping prices at a suitable level, and trying to make the customer's shopping experience as pleasant as possible. E-grocery's main value offering, picking and home delivery, also focuses on the last part of the demand chain. However, there are several opportunities for the e-grocer to get involved also in the earlier steps of the chain (see Figure 4).

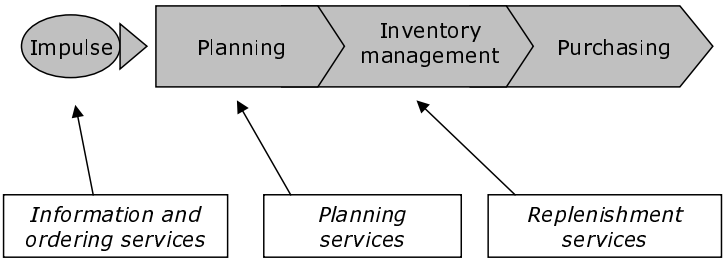

Figure 4. The grocery customer's demand chain offers many opportunities for value added services.

The e-grocer can support the customer's inventory management activities by offering different kinds of replenishment services. Instead of simply reacting to the customer's orders, the e-grocer can take over some responsibility for making sure that certain regularly needed products are available. Some development in this area has already happened. Netgrocer, for example, offers its customers a replenishment service (Netgrocer, 2001). The service is not very sophisticated; the customer can choose products that she wants to have automatically replenished every week, or, for example, every month. Streamline too offered its customers a similar service, which became quite popular. According to Ransdell (1998), the average Streamline household used the replenishment service for more than ten items.

The e-grocer can also support the customer's planning activities. Some e-grocers offer recipe databases that are linked to their ordering systems in a way that the customer can do her planning on a meal, rather than an ingredient level (see, for example, Matomera 2001; SokosHerkku, 2001). Others have gone even further. Shoplink, for example, offered its customers a three-week meal plan in which the ingredients for specified menus were automatically added to the subscribers' orders along with the recipes needed (Kasdon Sidell, 1999).

By offering information to its customers in new ways, the e-grocer can even participate in the impulse step preceding the demand chain activities. The e-grocers can, for example, use television in a more interactive way that allows customers to learn more about items they see on TV and order them instantly. OpenTV, for example, has launched tools and technology that make it possible to enhance digital TV broadcasts in a way that they become more interactive. After acquiring the special set-top box needed, the customer can use her remote control to select and purchase CDs, videos, mobile phones or, for example, clothes all while watching TV. (OpenTV, 2000)

As illustrated by the examples above, electronic grocery shopping offers an opportunity for the grocers to break out of their traditional role of provider of products, and step into the world of services. By exploiting these new service opportunities, the e-grocers can increase the value added of e-grocery by making every step of the customer's purchasing process more convenient or more efficient. In addition, the new services, such as automatic replenishment, are likely to increase customer loyalty, which is very important for e-grocery profitability (Reichheld and Schefter, 2000). Furthermore, they can be used for justifying an e-grocery cost premium.

Although there has already been some development in the area of e-grocery services, there still remains much to do. At the moment, service management is rather ad hoc, and the different players seem to lack service development strategies. There is a clear need for systematic service management: a process for finding, developing, introducing and evaluating services. The ECR movement has worked hard for creating guidelines for the product development process, and could be of much help in the area of services as well. However, services pose a significant challenge to the rather product centric ECR philosophy.

4. Conclusions

As much of the current e-grocery development work seems to be rather ad hoc, and many players are lacking clear development strategies, some kind of coordinated development movement involving both retailers and suppliers would be beneficial to the e-grocery business.

ECR is, of course, the natural candidate, especially since both the goals and most of the practical improvement concepts fit the e-grocery business very well. Although the current ECR framework does not support all parts of, for example, e-grocery supply management, ECR can be of much help in acquiring and disseminating the kind of knowledge needed in the form of best practice improvement concepts.

However, due to its somewhat narrow perspective, ECR can also hinder e-grocery development. ECR's focus on products rather than services, and savings rather than increased value, may turn existing ECR companies into slow movers in the e-grocery business. If the ECR companies blindly take existing ECR concept, such as category management, and use them as such in the e-grocery business, they will not be able to realize the full potential of e-grocery shopping. ECR can be a working development vehicle if and only if it is flexible enough to manage a change of focus, as well as incorporate totally new elements, such as multi-channel operations and services. If not, a new development movement is needed to get to the real core of e-grocery shopping instead of placing supermarket duplicates on the Net.

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